Arctic Shipping:

Challenges, Cooperation, and a Mandatory Polar Code

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Presentation Overview

- **Drivers of Arctic Shipping –** Environmental and Development Change
- **Canada-US Cooperation –** USCG Healy Ice Trials
- **Challenges of Arctic Shipping –** Remoteness and Ice Conditions
- **Towards a Mandatory Polar Code –** Impetus, Progress, and Probable Outcomes
- **Survey of Ice Classes –** Baltic, Russian, and Canadian Systems
- **Revisions to IACS Requirements**
- **Certification –** Polar Ship Certification, Permits to Operate in Polar Waters, Ice Certification
- **Concluding Remarks**

Drivers of Arctic Shipping

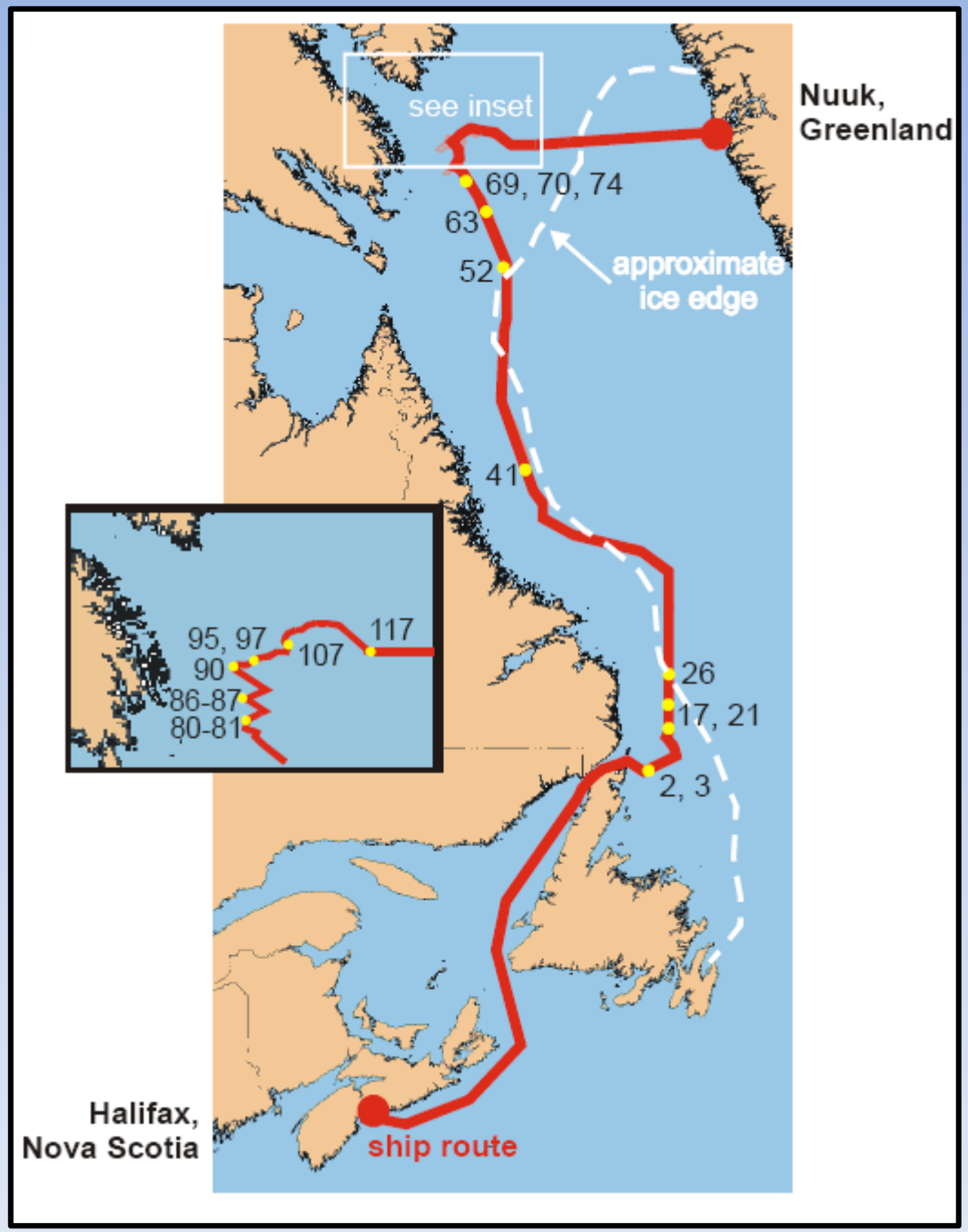
- Decrease in sea ice extent
- Longer summer navigation season
- Increased accessibility to Arctic areas
- Prospect of shorter Arctic transit routes

- Access to natural resources (hydrocarbons, minerals, fisheries)
- Community resupply
- Increased tourism
- Scientific research

Drivers of Arctic Shipping

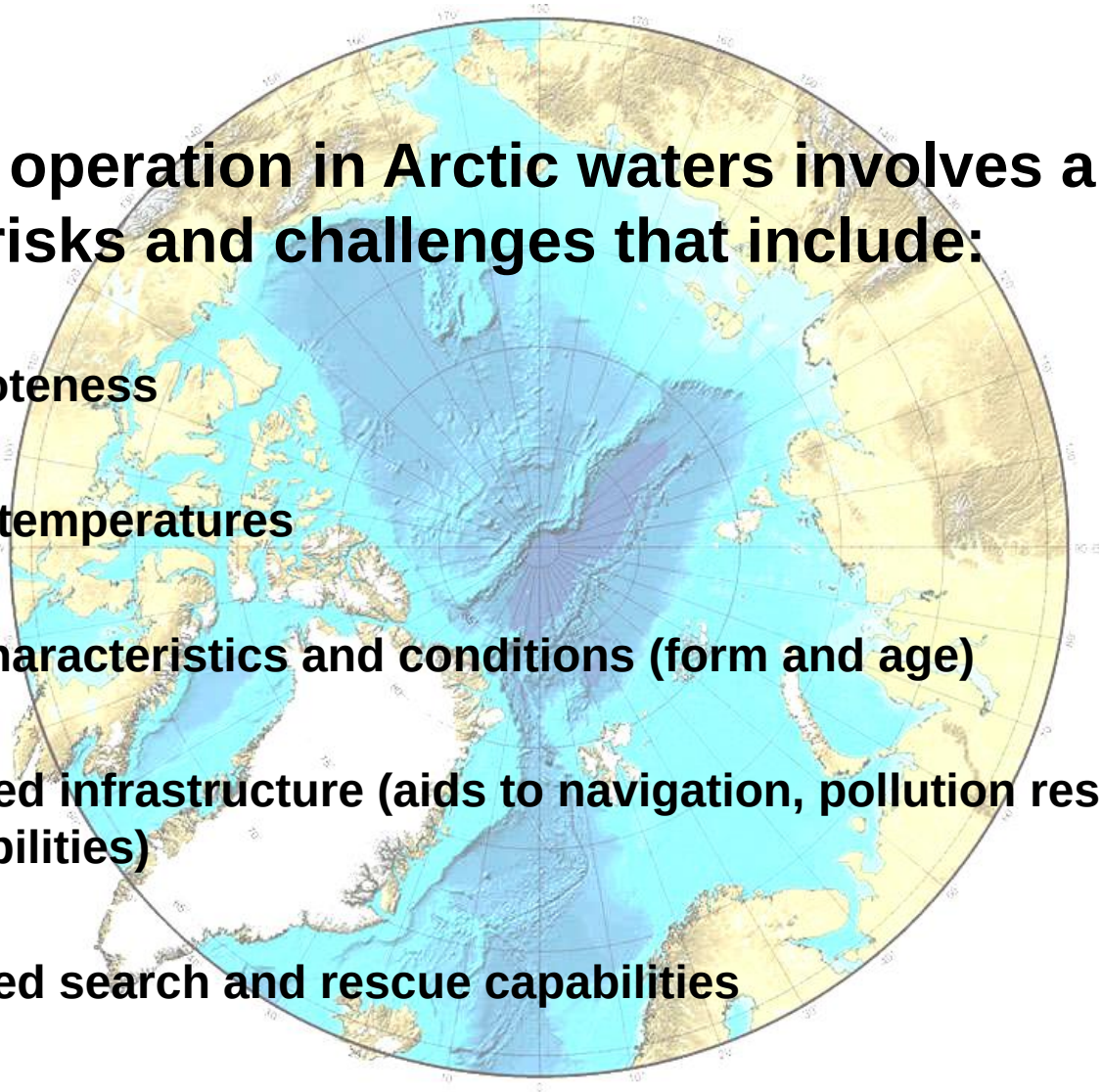
Canada-US Arctic Cooperation

- USCG Healy conducted ice trials in Canadian waters off Baffin Island in spring 2000
- Transport Canada liaised with the USCG
  - MOU between USDOT and TC on R&D dates back to June 1970
  - Arctic Cooperation Agreement of 1988 facilitates the transit of US and Canadian icebreakers through each others Arctic waters, joint science programs, and the sharing of research
- Sea/ice trials provide the platform for conducting many types of complimentary research



Map illustration showing the general location of the ice regimes encountered during the first leg of the trials (after Johnston and Gorman, 2000)

Arctic Operations

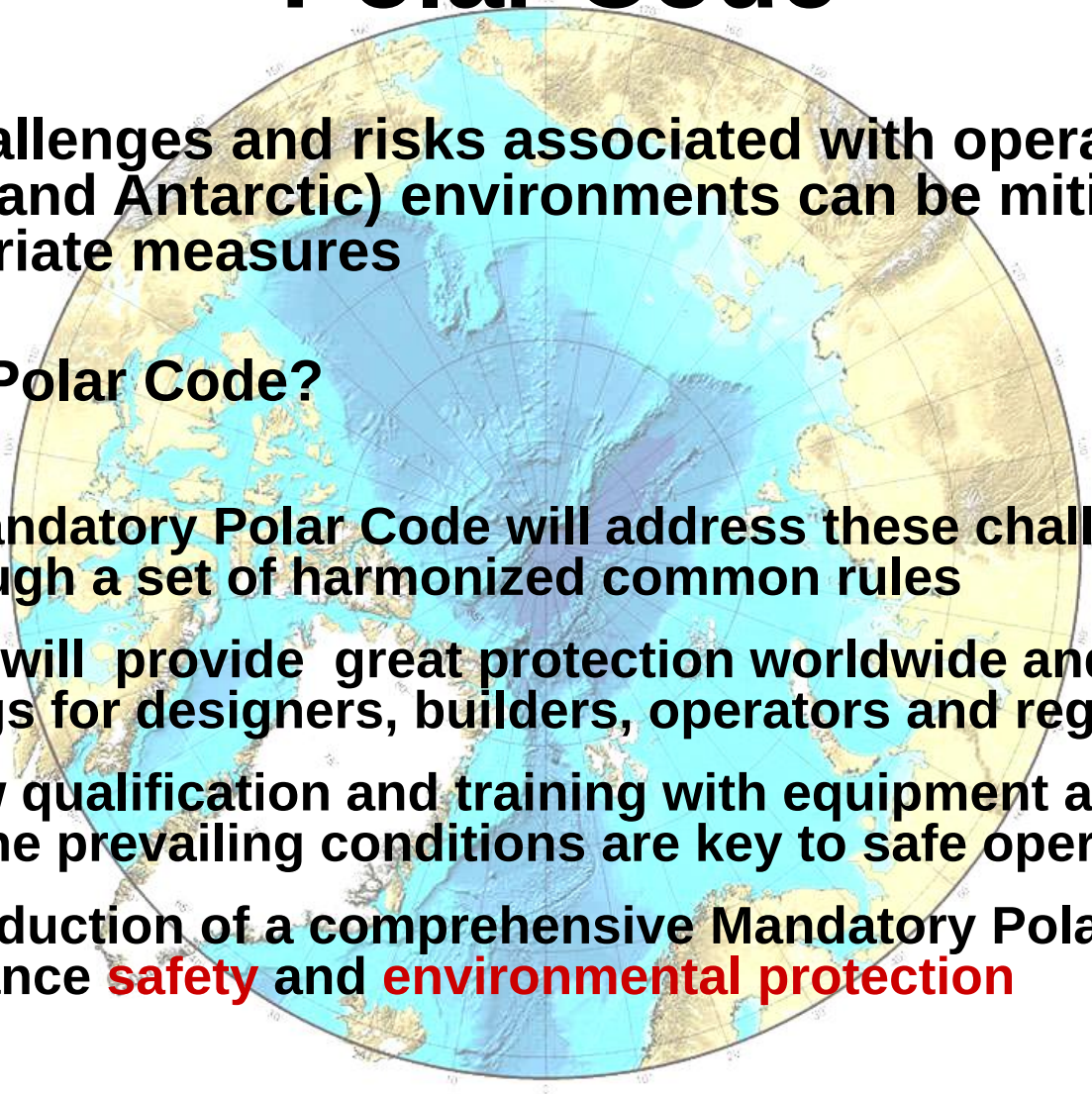


- **Vessel operation in Arctic waters involves a unique set of risks and challenges that include:**
  - **Remoteness**
  - **Cold temperatures**
  - **Ice characteristics and conditions (form and age)**
  - **Limited infrastructure (aids to navigation, pollution response capabilities)**
  - **Limited search and rescue capabilities**

In a recent interview with The Associated Press, retired United States Coast Guard admiral Thad Allen commented on the challenges of environmental response in the Arctic:

“One has to wonder, at the height of the Macondo spill, we engaged over 45,000 people and thousands of thousands of boats. Depending on the type of problem you might encounter there, the lack of infrastructure, lack of forward operating bases, austerity of the environment, plus the distance to port is problematic.”

Development of a Mandatory Polar Code

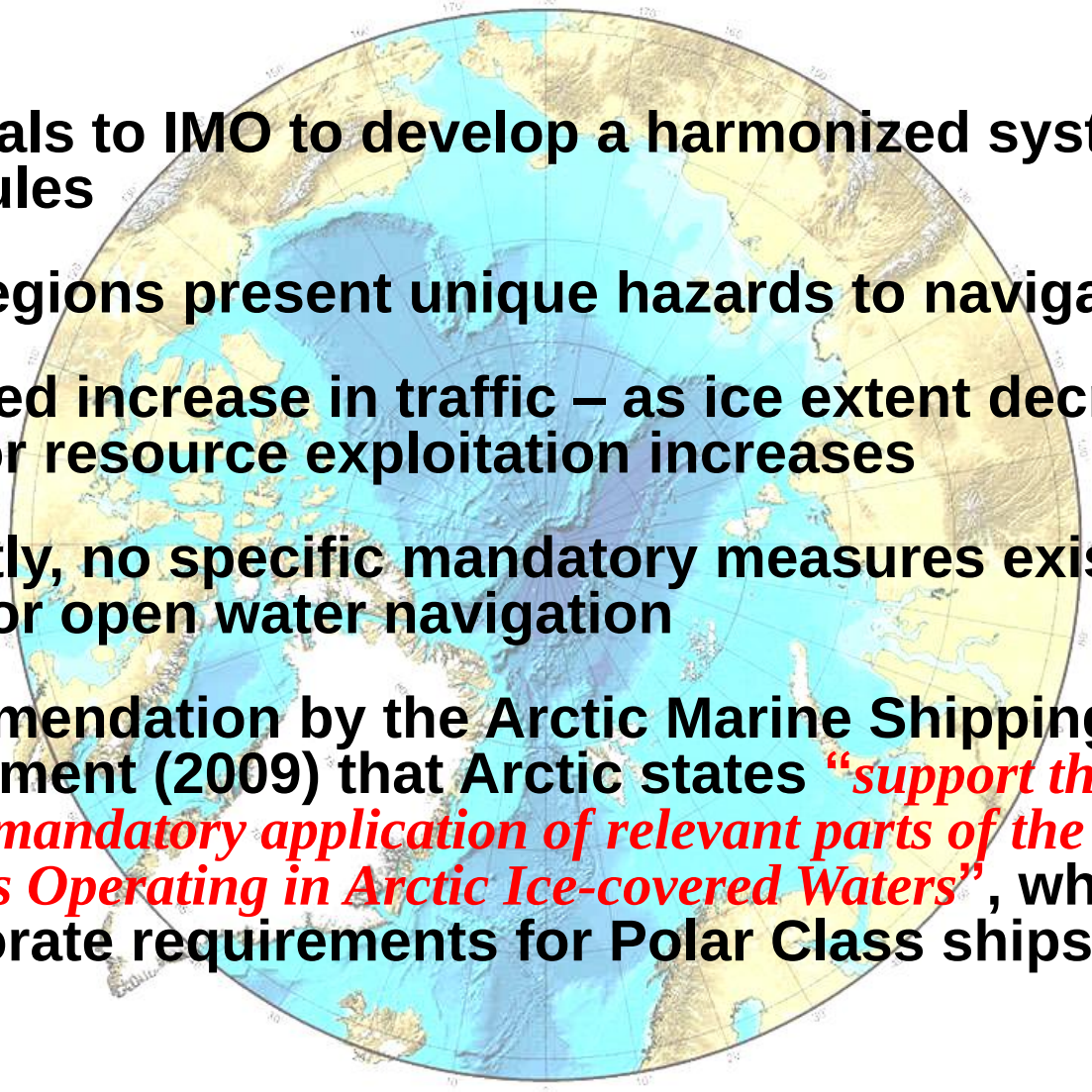


- **The challenges and risks associated with operating in Arctic (and Antarctic) environments can be mitigated with appropriate measures**

- **Why a Polar Code?**

  - **A mandatory Polar Code will address these challenges through a set of harmonized common rules**
  - **This will provide great protection worldwide and simplify things for designers, builders, operators and regulators**
  - **Crew qualification and training with equipment appropriate for the prevailing conditions are key to safe operations**
  - **Introduction of a comprehensive Mandatory Polar Code will enhance safety and environmental protection**

Impetus for the Polar Code



- **Proposals to IMO to develop a harmonized system of ice class rules**
- **Polar regions present unique hazards to navigation**
- **Projected increase in traffic – as ice extent decreases and drive for resource exploitation increases**
- **Currently, no specific mandatory measures exist beyond those for open water navigation**
- **Recommendation by the Arctic Marine Shipping Assessment (2009) that Arctic states *"support the updating and the mandatory application of relevant parts of the Guidelines for Ships Operating in Arctic Ice-covered Waters"*, which incorporate requirements for Polar Class ships.**

Progress to Date

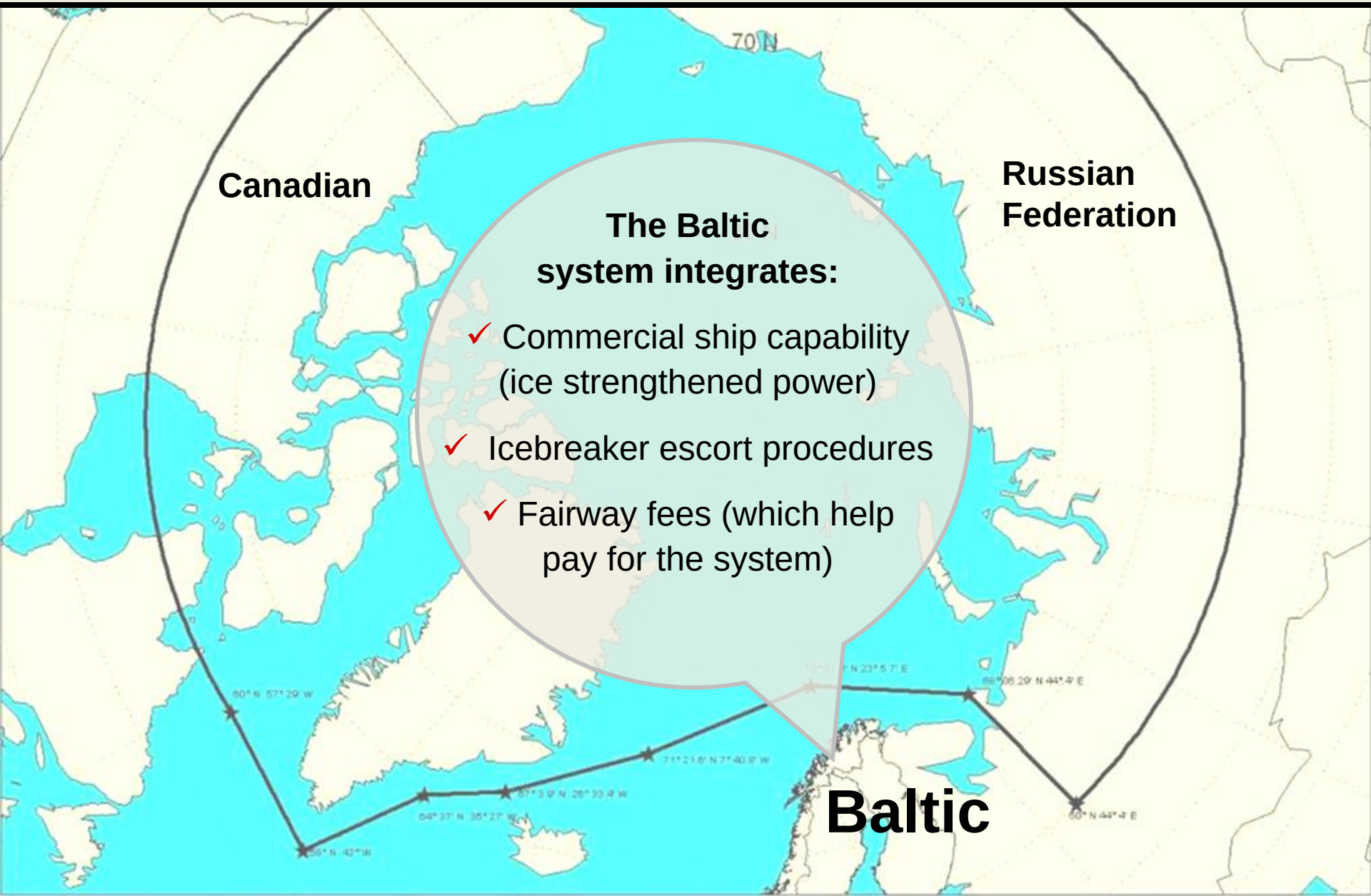
- **Polar Code to have Mandatory and Recommendatory parts**
- **Principles guiding Code development:**
  - Risk-based approach in determining scope
  - Holistic approach to mitigate risks to acceptable levels
- **Development and use of an extensive Hazards and Risks list for validating risk mitigation measures**
- **Hazards and risks provisionally consolidated into four main categories:**

1. Environmental conditions	(e.g. ice, temperatures)
2. High latitude	(e.g. remoteness, communications issues)
3. Environmental sensitivity	(e.g. slow recovery from damage)
4. Human element	(e.g. specialized training and experience requirements, physiological effects of polar conditions)

(Probable) Outcomes

- **Guidelines largely incorporated into the Code**
- **All such ships operating in Polar Waters will be required to carry some form of Permit to Operate and Ice/Polar Certificate addressing safe operating, including:**
  - safe speeds in different ice conditions
  - permissible operating temperatures
  - permissible operating areas/seasons, all to be determined
- **Certification will generally be delegated to Recognized Organizations**
- **Enforcement by Flag, Port and Coastal States, or VTS, based on area of operation**

“Survey” of Ice Classes



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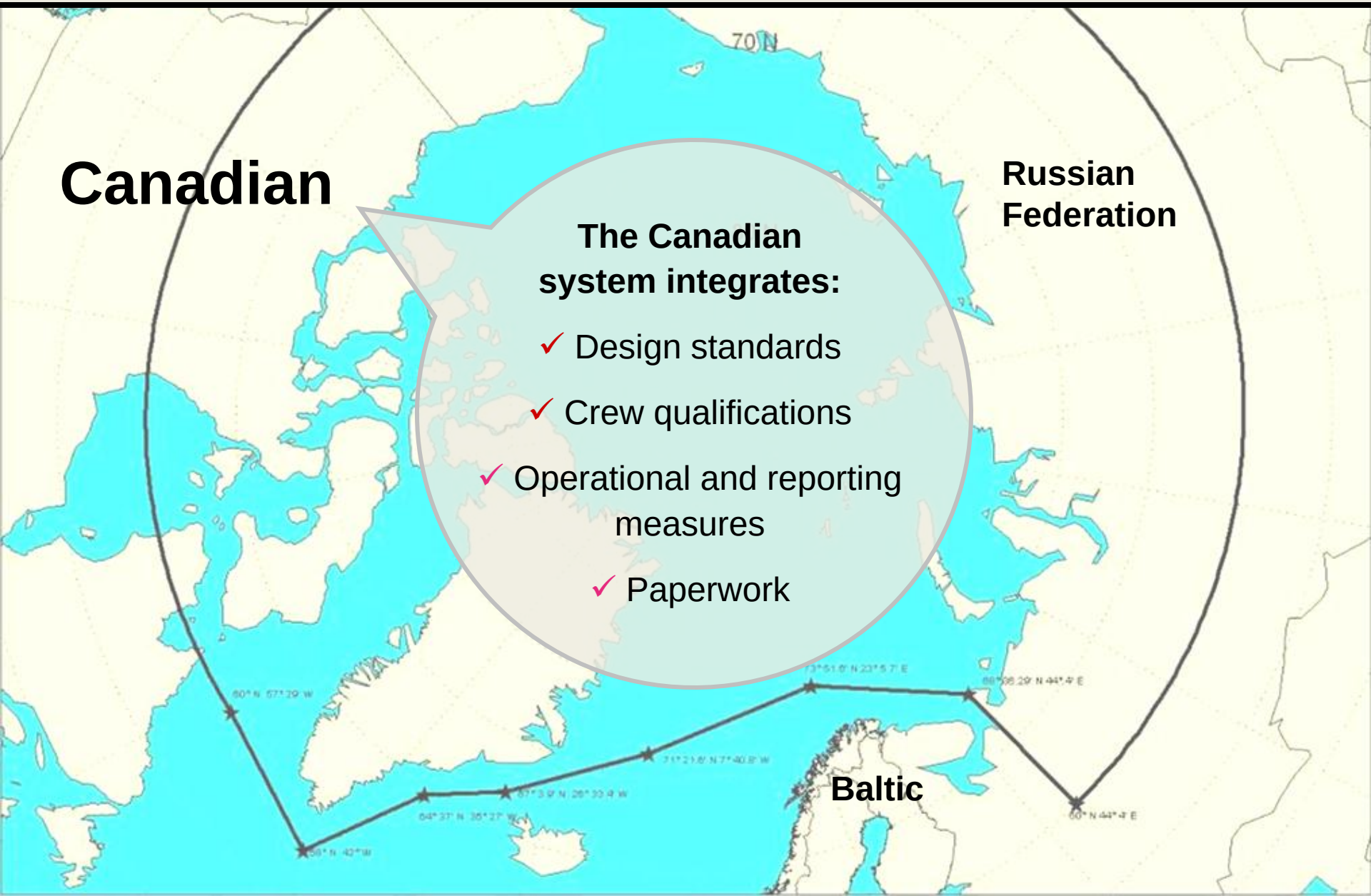


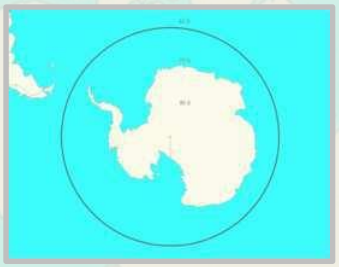
“Survey” of Ice Classes

Canadian

Russian Federation

Baltic

Harmonization



Includes the Antarctic

- ✓ *Guidelines for Ships Operating in Polar Waters* (2009)
- – Polar Code (underway)

IACS Polar Rules

Revisions to Unified Requirements

- **Description of Polar Classes in IMO Guidelines & URs**
- **Remove seasonal reference**
- **Treatment of materials should reflect Code requirements**
- **Extend other aspects of the URs to cover, say icebreakers**

Polar Class	General Description
PC1	Year-round operation in all ice-covered waters
PC2	Year-round operation in moderate multi-year ice conditions
PC3	Year-round operation in second-year ice which may include multi-year ice inclusions
PC4	Year-round operation in thick first-year ice which may include old ice inclusions
PC5	Year-round operation in medium first-year ice which may include old ice inclusions
PC6	Summer/autumn operation in medium first-year ice which may include old ice inclusions
PC7	Summer/autumn operation in thin first-year ice which may include old ice inclusions

Certification

1. **Polar Ship Certificate**

   - Indicates the Polar Class of the ship (and thus environmental conditions for which the ship has been designed for operation in Polar Waters)
   - Requires comprehensive structural survey

2. **Permit to Operate in Polar Waters**

   - Supplements the Polar Ship Certificate
   - Required in order to operate in Polar Waters
   - Stipulates constraints on the operation of the ship
   - Port / coastal States may impose additional limitations and require inspections

Concluding Remarks

- **The Arctic is undergoing remarkable transformation**
- **International cooperation is required to address the risks inherent to Arctic operations**
- **International cooperation leads to the harmonization of technical and operation standards**
- **A robust mandatory Polar Code will address the safety and environmental considerations associated with Arctic shipping through a harmonized and comprehensive set of best practices and risk-based measures**

Questions?